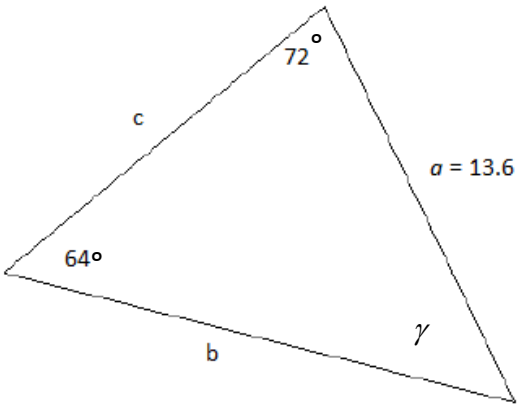
3.17 The Law of Sines

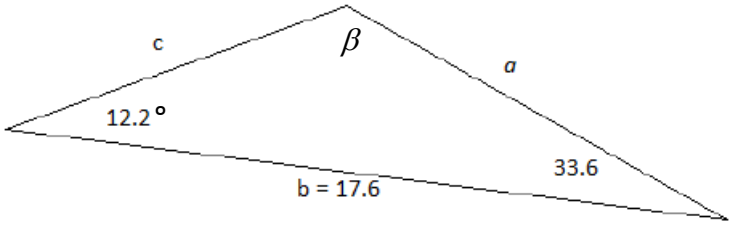
Name _____ Date _____ Period _____

Solve each triangle. Round approximate answers to the nearest tenth.

1.



2.



Solve each triangle with the given parts.

3. $\alpha = 10.3°,\ \gamma = 143.7°, c = 48.3$

4. $\beta = 120.7°,\ \gamma = 13.6°,\ a = 489.3$

Determine the number of triangles with the given parts and solve each triangle.

5. $\alpha = 39.6°,\ c = 18.4,\ a = 3.7$

6. $\alpha = 41.2°,\ a = 8.1,\ b = 10.6$

7. $\beta = 138.1°,\ c = 6.3,\ b = 15.6$

8. $\gamma = 128.6°,\ a = 9.6,\ c = 8.2$

9. $\beta = 32.7°,\ a = 37.5,\ b = 28.6$

10. $\gamma = 99.6°,\ b = 10.3,\ c = 12.4$

Solve each problem. Show work! Draw a diagram that represents the situation.

11. A traffic report helicopter left the WKSL studios on a course with a bearing of 210°. After flying 12 miles to reach I-80, the helicopter flew due east along I-80 for some time. The helicopter headed back to WKSL on a course with a bearing of 310° and reported no accidents along I-80. For how many miles did the helicopter fly along I-80? Round to the nearest tenth of a mile.

12. The F-106 Delta Dart once held a world speed record of Mach 2.3. Its sweptback triangular wings have the dimensions given $a = 19.2\,ft,\ \beta = 68°,\ \gamma = 82°$. Draw a diagram of the wing and find length c to the nearest tenth of a foot.

13. The angle of elevation of the top of a cellar telephone tower from point A on the ground is 18.1°. From point B, 32.5 feet closer to the tower, the angle of elevation is 19.3°. What is the height of the tower to the nearest tenth of a foot?

14. Find the exact value of each expression without using a calculator or table.

a) $\sin\left(\frac{5\pi}{2}\right)$

b) $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

c) $\tan\left(\frac{5\pi}{3}\right)$

d) $\csc\left(-\frac{\pi}{3}\right)$

e) $\sec\left(-\frac{3\pi}{4}\right)$

f) $\sin^{-1}\left(-\frac{1}{2}\right)$

15. Find the period of each function.

a) $y = 2\sin(\pi x)$

b) $y = -\cos(3x)$

c) $y = 3\tan(2\pi x)$

d) $y = 4\csc(2x)$